



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/730,194

12/04/2003

Andrew J. Hull

84280

2186

23523

7590

03/09/2005

NAVAL UNDERSEA WARFARE CENTER
DIVISION NEWPORT
1176 HOWELL STREET, CODE 000C
BLDG 112T
NEWPORT, RI 02841

EXAMINER

SUN, XIUQIN

ART UNIT

PAPER NUMBER

2863

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/730,194

Applicant(s)

HULL, ANDREW J.

Examiner

Xiuqin Sun

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☒ Claim(s) 3-5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. (U.S. Pat. No. 5804727) in view of Tang (U.S. Pat. No. 5784333).

Lu et al. teaches a method to estimate a real and imaginary dilatational wavespeed of a material (col. 3, lines 29-44), said method comprising the steps of: providing a specimen of the material (col. 4, lines 11-58 and cols. 6-8, lines 34-2); providing a source of acoustic waves at a zero wavenumber (col. 4, lines 11-58 and cols. 6-8, lines 34-2); positioning said specimen at a distance from said source such that said acoustic waves conform to plane waves (col. 4, lines 11-58 and cols. 6-8, lines 34-2); exciting said specimen with said acoustic waves (col. 4, lines 11-58 and cols. 6-8, lines 34-2); measuring transfer function data subsequent said excitation of said specimen (col. 5, lines 18-54 and cols. 6-8, lines 34-2); calculating said transfer function data (col. 5, lines 18-54 and cols. 6-8, lines 34-2); and determining the real and imaginary dilatational wavespeed of said specimen from said calculated transfer function data (cols. 5-6, lines 55-33 and cols. 6-8, lines 34-2).

Lu et al. do not mention explicitly: measuring said transfer function data in frequency domain; calculating said frequency domain transfer function data to closed form.

Tang et al. teach a method of determining the permeability of earth formations by processing signals recorded by an acoustic logging instrument, including the steps of: measuring said transfer function data in frequency domain, and calculating said frequency domain transfer function data to closed form (col. 6, lines 8-48; col. 7, lines 29-67; col. 8, lines 1-67; col. 1-40 and col. 11, lines 7-40).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Tang et al. in the invention of Lu et al. in order to calculate the transfer function data more accurately, and then to determine the complex characteristics of dilatational wavespeed of a material efficiently from the transfer function data in spectral space (Tang et al., col. 6, lines 8-48; col. 7, lines 29-67; col. 8, lines 1-67; col. 1-40 and col. 11, lines 7-40).

3. Claim 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. in view of Tang et al., as applied to claim 1 above, and further in view of Zeroug et al. (U.S. Pub. No. 20040054474).

Lu et al. and Tang et al. teach the subject matter discussed above. The combination of Lu and Tang does not mention explicitly: exciting said specimen for at least two nonzero wavenumbers; measuring transfer function data subsequent to the excitation of said specimen for at least two nonzero wavenumbers; calculating said transfer function data to closed form subsequent to said measuring step said specimen

for said excitation for at least two nonzero wavenumbers; determining an estimated real and imaginary shear wavespeed of the material from said transfer function data calculated to closed form subsequent to said measuring step of said specimen for said excitation for at least two nonzero wavenumbers.

Zeroug et al. teach a method for estimating the time varying mechanical properties of a material, comprising the steps of: exciting a specimen of a material for at least two nonzero wavenumbers (section 0056); measuring transfer function data subsequent to the excitation of said specimen for at least two nonzero wavenumbers (sections 0056, 0062-0064, 0075-0077, 0080 and 0084-0093); calculating said transfer function data to closed form subsequent to said measuring step said specimen for said excitation for at least two nonzero wavenumbers (sections 0056, 0062-0064, 0075-0077, 0080 and 0084-0093); and determining an estimated complex shear wavespeed of the material from said transfer function data calculated to closed form subsequent to said measuring step of said specimen for said excitation for at least two nonzero wavenumbers (sections 0056, 0062-0064, 0075-0077, 0080 and 0084-0093).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Zeroug et al. in the combination of Lu and Tang in order to determine the shear strength and the linear elastic parameters of said material as an important mechanical property from knowledge of the velocity of propagation of the compressional and shear acoustic waves inside said material (Zeroug et al., section 0003).

Allowable Subject Matter

3. Claims 3-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Allowance

4. The following is an examiner's statement of reasons for allowance:

The primary reason for the allowance of claims 3 and 4 is the inclusion of the limitation of obtaining a real and imaginary shear modulus using a grid method of the materiel from said real and imaginary determined shear wavespeed. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR

1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Response to Arguments

6. Applicants' arguments received 1/12/2005 with respect to claims 1-5 have been considered but are moot in view of the new ground(s) of rejection.

Claims 1 and 2 are rejected as new prior art reference (U.S. Pat. No. 5784333 to Tang et al.) has been found to teach the limitations argued by the Applicants. Detailed response is given in sections 2 and 3 as set forth above in this Office Action.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuqin Sun whose telephone number is (571)272-2280. The examiner can normally be reached on 6:30am-4:00pm.

Art Unit: 2863

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571)272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Xiuqin Sun
Examiner
Art Unit 2863

XS
March 4, 2005


John Barlow
Supervisory Patent Examiner
Technology Center 2800